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THE WORLD AND THE BLIND MAN

BY CHARLES MAGEE ADAMS

I

This whole attitude of mind we call civilization or culture depends peculiarly on a delicate balance between the contrasting mental activities, thought and emotion; and it proves exceedingly difficult to approach any subject touching blindness without disturbing this balance, for the reason that emotion has always been the preponderant reaction to blindness.

People can laugh at what happens to a deaf man, discuss the loss of an arm or paralysis with complete calm, yet the moment blindness is mentioned there is an instant and involuntary flux of emotions, such as pity and sympathy, that distorts the entire perspective. These emotions, although brought about by reasons somewhat obscure, are, nevertheless, universal, and color every concept of the blind held by the seeing. During this discussion it may therefore prove necessary to swing to the other extreme in order to restore the balance.

There has always been a particularly keen interest in the psychology of blindness, even before the general interest in psychology now so marked. The seeing are constantly asking questions covering every phase of it — and quite normally. Sight is such a universally used and useful sense that the loss of it would seem to bring about a psychological condition difficult to conceive. But two facts pertinent to an analysis of the subject are revealed by these questions: first, that in general the seeing believe (anyone who has read Dr. James H. Robinson's *The Mind in the Making* will grasp the significance I am giving this word) that the psychology of the blind is something fundamentally different from that of the seeing; and second, they believe that the lack of sight is all but compensated for by an added keenness of remaining senses, new senses, and an increased richness of experience. These beliefs are not confined to people easily deluded on usual matters, moreover. They can be found in the most amazing quarters. In spite of this, the facts (having been blind nineteen years I feel fairly familiar with the facts) show that the psychology of the blind differs from that of the seeing only in that the blind do not see.

This is not intended as a paradox or an attempt to turn an epigram. It is a proposition of basic importance, and the only starting-point from which the subject can be properly approached. The psychology of the blind is neither irrevocably removed from that of the seeing nor all but identical with it through some compensating means. It is simply the full psychology of normality with such changes and deficiencies as are brought about by the lack of sight. The blind have no power or sense not possessed by the seeing, not even an increased keenness of the remaining senses; merely a subtraction of sight with a somewhat better utilization and development of the four other senses to meet conditions.

A peculiar fact in connection with

this last has been responsible for much of the confusion, apparently. The chief reason the blind display a marked superiority over the seeing in the other senses, particularly hearing and touch, is that the seeing persist in concentrating on sight regardless of conditions. If a man is awakened in the night he tries to see what has awakened him, no matter if the room be inky dark. Sight is always the most important sense and the one called on first. So, even when he is blindfolded for comparative tests, the seeing man finds it extremely difficult to shift the focus of attention from sight to these other senses. Paradoxically enough, therefore, the reason a blind man utilizes these senses to a greater extent is because he has given up this natural attempt to see, which in many cases requires a long time, particularly if sight fails gradually, since it is for the most part an unconscious process linked up with how completely blindness is accepted as a fact.

It must not be forgotten too that there are only four remaining senses, for this has some widely ramified consequences. First, it means that the blind are confronted with a constant twenty per cent deficiency in received impressions, the significance of which I hope to make clear; and secondly, it precipitates an entire new sense-coördination. Normally we do not realize our senses are coördinated until possibly a cold reminds us how heavily taste depends on smell. Taking a sense as important as sight out of circuit necessarily forces some vastly more far-reaching readjustments. But perhaps the best way to make this as well as these other basic considerations clear is to begin with hearing.

II

Hearing is the first sense the blind turn to in the course of reorientation; the one that responds most easily to development; the one which proves, ultimately, the most useful. The seeing call on it for a wide range of uses in normal intercourse and therefore not so many additional mechanics need be provided as in the case of touch. But the blind merely develop the possibilities of hearing to their logical limits instead of being endowed with any increased sensitiveness.

I can best demonstrate this by two seeing friends of mine. One, an electrical engineer, can pick out and interpret in the hum of a turbogenerator a whole series of sounds of which I am not even aware; the other, an automotive engineer, can do the same with the engine of a passing car. They have merely developed their hearing to be of particular service to them in their professions, in the same way in which the blind develop their hearing to be of particular service to them in meeting the conditions imposed by lack of sight.

Sound reflection is a typical example. Whenever a sound impinges on a flat vertical surface of any appreciable area it is reflected much the same as light — not echoed. An echo is also a reflection, but of a pronounced type; but the sort of reflection to which I refer takes place at distances shorter than necessary for an echo, and results in merely the addition to the original sound of a characteristic quality that could probably be classified as an overtone. Poles, trees, walls, buildings, cars, any fairly flat, fairly vertical, good-sized surface, will produce this effect. The seeing rarely, if ever, are aware of it, of course. They do not need to be. But the blind not only are aware of it but make thoroughly practical use of it for such everyday purposes as locating objects, or finding, for example, the gaps in a long line of parked cars. When a blind man taps his walking-stick on the pavement or shuffles his feet he is more often causing sounds which can be reflected

than trying to determine his location by touch.

This utilization of one of hearing's possibilities generally wasted is alone responsible for the sixth-sense myth, and only one of the several ways in which this sense when developed serves the blind. But hearing also has two decided limitations particularly significant. In the first place it is a far less selective sense than sight.

Sight impressions are received from only one general direction and any object in this direction can be brought into focus so sharply that practically nothing else can be seen, merely by the expenditure of what is for the most part a muscular effort. But the case of hearing is quite different. Sound impressions from every point within audible range are received without any considerable variation due to direction, and each is heard. The slam of a door, voices in the street, a train whistle, a motor horn, register as vividly and definitely as piano music, and the only reason the music is heard and these other sounds apparently are not is that a more or less unconscious effort of attention has 'tuned' them out and let through the music.

I doubt if the seeing grasp what this means to the blind, because they depend on sight as an aid to hearing far more heavily than they realize. Lip-reading, for example, bears much of the burden of conversational reception, as the simple experiment of holding the lips motionless will prove. But to the blind hearing is like a radio set which permits all stations to be heard simultaneously and leaves it to the listener to concentrate on the one he wants, which means a tremendous demand on attention. In the city streets with their roar and rattle of traffic, or even at small social gatherings, the 'tuning in' of a particular voice and the 'tuning out' of all other sounds require a constant effort that is by no means small and which makes for a high rate of fatigue.

This is further aggravated by hearing's second limitation. The auditory nerves are considerably smaller than the optical — the fact behind the frequently encountered statement that things seen are more vivid than things heard. To the blind this of course has a special significance. It means that the sense which must handle the great bulk of received impressions can transmit less of them to the brain than the sense which handles the bulk for the seeing, or, in engineering terms, that the input-output efficiency of hearing is less than that of sight. So the result is that if an event can be translated equally well into terms of sight and sound the blind will not receive as vivid an impression of it as the seeing, and also that the rate of fatigue is increased.

This has not been generally recognized. A seeing person who has been reading or drawing or doing other work requiring high visual concentration for a long time finds not so much his eyes themselves as his whole optical mechanism is tired; and when a blind man has been listening intently for a long time he experiences much the same sort of fatigue. Not that his ears are tired, but his entire auditory mechanism is, even more so than the other's optical mechanism, because of the lower efficiency and the added work thrown on it. Any familiar sound like the purr of a car's motor, music, or a voice reading, will produce this result if continued too long and, if carried further, it will bring on a nervous exhaustion that can be corrected only by quiet or sleep. The fact that the seeing have another major sense they can turn to also goes far toward relieving them of this experience. After a concert, for example, when fatigue might normally appear, they can shift the bulk of attention to seeing, giving the auditory mechanism an op-

portunity to recuperate, while the blind obviously cannot.

The whole situation is further aggravated by the auditory mechanism's lack of protection. The pupils protect the eyes, contracting when the intensity becomes too great for comfort, and the lids close when extreme intensities are reached. But no matter how terrific a sound is, the ears must receive it with the same delicate end organs that receive the faintest murmur; often this brings a result like that of glare.

It must not be concluded from all this, however, that the sound conditions most agreeable to the blind are quietness or absolute silence. On the contrary, I find that any unusual quietness produces a depression strikingly like that which gloom produces on the seeing. The dead of night or isolated spots make me strangely dull and uneasy. There is apparently a minimum of received stimuli necessary for mental alertness, which hearing must supply in the case of the blind.

The determination of distance and direction — a major service hearing performs for the blind — is not a matter of increased sensitiveness but for the most part the elimination of more or less inherent errors. At a certain point on a certain street in my home town, for example, the music of a piano appears to come from a building a door or two ahead and on the far side, while a few steps' progress shows that in reality it is coming from a building a little farther along on the near side, the illusion being caused by a peculiar reflection of the sound. This is only one of the errors that must be guarded against constantly. A line of shrubbery or a drapery may damp a sound so that an entirely mistaken estimate results. At two points, one directly in front and the other directly behind, I find it next to impossible to be certain whether a sound comes from one or the other. In proportion to its importance, however, it seems to me we know less about hearing psychologically than any other sense.

III

Touch, the second sense the blind turn to, has been perhaps most in the spotlight but at the same time easily the most overrated of all the senses they utilize. First of all it has a fatigue factor second only to smell, as tactile reading, its most conspicuous application, demonstrates. Apparently, it should be as easy to read lines of embossed characters with the fingertip as it is lines of printed characters with the eye, once the alphabet is mastered. But it is not. Touch simply tires out. In my own case (and I have been reading by touch eighteen years) two hours is the extreme limit for continuous reading and long before that the end organs are so irritated and there is such a general restlessness that it is most difficult to proceed.

The general usefulness of touch is also limited by the fact that it is a motor sense; by which I mean that the fingers must be moved over the surface of an object, instead of merely brought in contact with it, if an impression is to result. Many of the seeing show they are not aware of this when they simply place the hand of a blind person on an object. Reach, too, sets sharply defined bounds to touch's perspective, often resulting in a warped or fragmentary concept of an object, as Kipling's story of the six blind men and the elephant aptly illustrates. It is quite impracticable to touch many objects such as moving machinery, hot metal, or live wires, at all — which restricts the usefulness of the sense still further.

But even more important are the factors that affect the sensitiveness of touch. It is generally believed that the thickness of the skin decides that, pri-

marily — a thick skin resulting in a dull touch and a thin skin in a delicate touch; but it has been my experience that this is of much less consequence than cold, for example, which makes touch all but useless, or excessive heat, which results in an irritation and speeding of fatigue just as disastrous. Long fingernails too, and not long in the accepted sense at all, reduce sensitiveness many per cent, as does also a film of foreign matter like dust or oil on the finger ends, so thin that it can scarcely be noticed otherwise.

But as in the case of hearing, the blind are more proficient in touch than the seeing, not by reason of any peculiar endowment but simply because they have developed its normal possibilities. I know seeing mechanics and surgeons who can perform feats of touch no blind man can surpass, merely by taking advantage of the same sort of development to make it of use to them.

Memory is similarly developed. The blind have long been reputed to have memories superior to the seeing, but this is simply a development and utilization of wholly normal possibilities as a result of necessity. Remembering telephone numbers, for example, or the order of phonograph records in an album would be quite worth while, if it were difficult, because it is such an effective lubricant to the otherwise squeaky mechanics of living — but it is not difficult. Memory is an unconscious function, doing its work without the slightest conscious effort if only it is given an opportunity, and again, as with hearing and touch, the seeing, taking advantage of this, often develop it to an even more remarkable extent than the blind. I know a man who can recite the entire Brown-and-Sharp wire table, a mass of unappealing and dissociated figures. But the greatest service memory performs for the blind, particularly on the human side, is the recognition of voices.

This ability obviously is the only practicable means at the disposal of the blind for indentifying people, and, being involuntary, it proves, as is not usually appreciated, most effective when the conscious mind stands aside and gives it the right of way. I find myself repeatedly calling people by name in response to their greetings without being consciously aware who they are till I hear my own voice. But an even more significant fact the seeing overlook is that a characteristic speech is most easily recognizable.

My friends, I know, think themselves slighted when I sometimes call them by name and at other times do not, but the difficulty is that they sometimes use a conventional greeting in a conventional way, leaving only the voice distinctive, while a characteristic greeting or manner affords infinitely more material for associations.

The similarity of voices is not confusing as a rule. Many are similar, to be sure, but I have never encountered absolute doubles, and in general voices are as sharply differentiated as faces — in fact, often far more. The only difficulty I have experienced, strangely enough, is caused by one person's having several voices. All of us have; we change tone and quality more or less unconsciously according to our mood and condition. But in some the change is dismayingly marked. One woman, for example, has as many as five voices, each quite distinct.

The physical condition is also revealed by the voice in a striking degree, both as to change and normal characteristics. Fat people, for example, have a voice quality which is all but invariably detectable. Character, too, is easily read. In fact it seems that character is revealed in the voice even more fully and accurately than in the face,

no doubt because the seeing, failing to recognize this, make less of an attempt to mask the voice.

Perhaps the one thing the blind do, however, which has afforded more opportunity for the sixth-sense and special-endowment myths than any other, is to get about unassisted. When it has been comparatively easy for the seeing to understand other things there has always been some peculiar difficulty about this, and after what has been said about hearing and touch the difficulty may be aggravated by the assumption that this ability is merely a combination of these two senses, which it is not. Hearing and touch are material aids in getting about, to be sure, hearing being of particular value through its utilization of sound reflection. But they are only aids; the faculty which is the essence of this ability is equilibrium.

Blindfolding a seeing person and letting him walk the length of a room, as in the pin-the-tail-on-the-donkey games of childhood, will demonstrate this. Even though traversing a familiar floor his course will prove uncertain and he will in all probability bring up wide of the mark, while a blind person under similar conditions will steer a straight course. The explanation is that in walking what appears to be a straight line is in reality a series of curves, corrected by sight in the case of the seeing to give an approximate straight result, and in the case of the blind by hearing and touch, to some extent, but even more by direct dependence on equilibrium, the sense serving much the same purpose as a gyroscope.

With hearing and touch functioning properly, for example, I find myself deviating from a straight course whenever I carry a heavy parcel in one hand or in any way impede the natural swing of either arm, the deviation being to the left or to the right according to which side is affected. Equilibrium is also effective in horizontal as well as vertical planes, making a trifling dip or rise in floors or streets instantly detectable. To the blind getting about is, therefore, merely a matter of letting equilibrium do its work, plus knowing the ground as well as a seeing person knows his own house, which is not as difficult as it seems.

Traversing a spot only a few times makes it as familiar as it does visually to the seeing, and even if it were difficult it would be vastly preferable to step-counting. This has no practical value whatever, in spite of popular assumptions to the contrary. It throws an undue burden on memory and attention and in addition has enormous possibilities for error because the length of a given person's steps varies so widely under different conditions that a difference of as much as ten or twenty yards can develop in as few as a hundred steps.

One interesting detail I have come upon in connection with getting about is that time and not distance is the factor that determines knowledge of location. Apparently the opposite should be true. In traversing familiar ground an unconscious measuring of distance should give the clue to location; but when walking more rapidly than usual I find I reach given points before I think I should, and when walking more slowly than usual think I should reach them before I actually do. This shows that time and not distance is unconsciously measured.

Snow and ice form peculiar handicaps to the blind in getting about, not because of added risks but because they radically alter familiar conditions. Even an inch or two of snow muffles normal sound reflections so effectually that the entire audible aspect of a place is changed, and a very thin coating of snow or ice is enough to blot out landmarks under foot as important to the

blind as houses and hills are to the seeing, thus necessitating the learning of new directions and reactions.

IV

However, of all the varied phases of the psychology of blindness the one that has in my experience been the subject of more questions than any other is that of imaging. People ask what sort of impression the blind have of such things as a city or a sunset, if they cannot see them mentally, and if they cannot see in their dreams. All this is natural. The impressions we carry away from an event or form of something not directly experienced exert a powerful influence on our whole manner of thinking, and the seeing have been so accustomed to confining these impressions largely to sight that they find it difficult to conceive of the blind's doing otherwise. The result is that there is a surprisingly widespread belief (Dr. Robinson's connotation again) that the blind retain mental pictures of things seen before blindness and construct similar pictures of things experienced through other senses or described to them. But this is not true.

Visualization, like all imaging, is nothing more than a memory process. Even a mental picture of something not actually seen is an assembly of parts of things which have been seen. Things remembered and hence imaged therefore tend to be things most vividly or recently experienced, and also tend to be remembered and imaged in terms of the sense through which they were experienced. So, to the blind this means that things seen are crowded farther and farther into the background by things heard and felt, until for all practical purposes the power of visualization is lost not long after sight.

In my own case the power to visualize faded out in less than two years. Not that it has been entirely lost. I can still reconstruct scenes and events I saw, clearly and accurately, and piece them together into tolerable pictures of other things experienced since. But these early impresssions are obviously inadequate for this. A modern automobile cannot be built up on one of the first single-cylinder models, or a bombing plane on a Wright glider; and I can hold these pictures for only a moment at the expenditure of an effort wholly out of proportion with the result. So, in spite of a psychologist's suggestion to the contrary, I have let my imaging slip naturally into terms of everything but sight.

My impression of a particular National League game, for example (not of the plays themselves, because they reach me secondhand and are therefore merely known), is one of crowds squirming and shuffling down runways, sticky humidity, confused wisps of perfume and cigar smoke, the rattle of applause and boom of cheering, insistent gum-venders, and a loud nasal-voiced man who persisted even during the tensest moments in telling over and over how he had been hurt in an automobile accident — all simply heard or felt but thoroughly definite, and things that make up much of the seeing's impression total also.

In the same way I have a clear impression of a quiet spot just outside of town, a store that is attractive and one that is not, a house I like and another I do not, and my dreams also are always in terms of sensations other than sight. In all cases to a greater or less extent, however, I find my impressions are made up more of what may be termed sensation overtones than sensations themselves.

By this I mean that what we remember is not facts as much as our reaction to and interpretation of facts, just as what we refer to as a singer's tone is not

only the note actually struck but the color and quality given it by the added overtones. I have a satisfying impression of a certain living-room, for example. I always think of it as something warm, comfortable, and hospitable. But this impression is based simply on the fact that there was a snapping open fire in it and that I chanced to be given an easy-chair after a long cold ride. However, practically all our sensations are unconsciously summarized and translated in this way.

In the case of impressions coming through others, reactions play an all but exclusive part. Indirect lighting is something I have never experienced, but I have a clear impression of it based on my memory of and reaction to descriptions. Of other things like the phenomenon of electron emission my impression fades out into a concept, something merely known, while the seeing no doubt visualize it in the terms of a diagram.

In the case of people, I find that what I have termed these sensation overtones predominate to such an extent and are so infinitely higher and more numerous that they practically displace sensations themselves. When I think of, for instance, a particular friend I think of his strengths, his weaknesses, what he has done and might have done, his reactions to various situations and my reactions to him; not singly or in groups picked out for analysis but as a sharply defined composite that colors my entire feeling toward him, all without being more than aware of any physical points of contact. Indeed, and this often confuses the seeing, I find a description of a person's appearance does not help me to image him at all and, on the contrary, requires a conscious effort for me to associate it with him. At this moment, for example, I cannot tell the color of eyes or hair of more than half a dozen of my friends, not because I have not been told but because I have a clear impression of them without such facts. They are lugged in and therefore soon forgotten.

Of the remaining details of the general psychology of blindness, one that seems worth mentioning is the peculiar effect of temperature. An extreme in either direction generally affects the seeing, bringing about mental depression and bodily debility, and in the case of the blind I find this result is considerably more marked. Even a comparatively slight variation from normal claims attention so insistently that it disturbs concentration, the explanation apparently lying in the fact that, with sight subtracted, temperature occupies proportionally more of the sense total and its reactions are therefore more preponderant.

Another fact is that a pain or purely physical disturbance of the eyes dims the mental vision (not to be confused with visualization) and mental grasp in general. But this is probably due to a simple nervous reaction.

Concluding, I cannot refrain from repeating that in spite of what may be inferred from all that has been said, the psychology of the blind differs from that of the seeing only in that the blind do not see; and, further, I want to point out that the psychology of the blind, like all psychology, is simply the means, the stimulus and reaction mechanism, through which certain ends are attained. For the blind these ends are the same in every essential particular as for the seeing; the same needs, the same desires, the same aspirations, the same pleasures; and when the seeing, by exercising the faculty of thought referred to at the outset, grasp this and all its significance there will not be, as there is now, a distinct psychology of the blind among the seeing. But that, as has often been remarked, is another story.

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